

searches connected with what may properly be termed Astronomical Physics.

Nevertheless, we are at all times prepared to devote the large apertures of the instruments to any desirable purposes to which they appear adapted: and although the Observatory has only been finally completed in all its details within the last few days, a considerable set of observations of six of the satellites of Saturn have been taken, which we trust will prove of some value, and will shortly be communicated to the Society.

In concluding the description of these really noble specimens of astronomical engineering, I cannot refrain from recording my admiration of the admirable manner in which Mr. Grubb has much more than merely fulfilled his contract with the University of Oxford. It has been one among many other happy results of the removal of ancient fiscal misarrangements, that English opticians have at length overtaken their eminent brother artists on the Continent. It is not now so much to Munich that it is necessary to resort for our largest and most perfect instruments; but gigantic observatories and colossal telescopes are at this moment in course of construction in the workshops of Dublin, intended to promote astronomical research in some of the chief cities of Continental Europe.

I may also, I trust, be pardoned for repeating a remark which I believe I have made in this Society before, to the effect that the artists and constructors of these admirable astronomical machines—admirable alike for their ponderous stability, for the smoothness of their motion, and for their adaptation to the most minute delicacy of accurate measurements—claim at our hands a meed of gratitude and honour scarcely if at all less than that which we so gladly accord to the illustrious astronomers who so successfully avail themselves of the mechanician's skill. And all honour be also paid to the enlightened munificence of the University of Oxford, who, notwithstanding their comparatively limited pecuniary resources, and the vast and ever-increasing variety of claims that are made upon them, have devoted so much encouragement and so considerable a sum to the cultivation of the science which so deeply engages our own sympathies. Dr. De La Rue also may be congratulated on the hitherto successful arrangements to which his own generosity gave the first impulse.

---

*On the Preparations which are being made on the Continent for promoting Physico-Astronomical Observations.* By Warren de La Rue, D.C.L., F.R.S.

It is scarcely necessary for me to tell the Fellows of the Royal Astronomical Society that their favourite branch of our science, namely, the Physics of Astronomy, is now engaging the earnest attention of foreign professional astronomers to a greater extent than obtained only a few years ago, and that grand preparations.

are now being made at several continental State-Observatories to grapple with the important truths which can only be revealed by adequate instrumental appliances such, indeed, as are far beyond the reach of most private fortunes. It was a matter of satisfaction to me to learn that photographic Observatories are to be included in at least two of those Observatories, namely, in Paris and Vienna.

I was particularly impressed with the new Observatory in course of erection in the vicinity of Vienna, and I have thought that an account of it might have some interest for the Royal Astronomical Society; hence I have ventured on making this short communication respecting it.

The old Observatory is situated nearly in the centre of Vienna, in the midst of narrow bustling streets, closely overlooking house-tops and chimnies, and, consequently, quite unfitted for accurate astronomical work. It was founded in the year 1753, its first Director being M. P. M. Hell; it was rebuilt on the same ill-adapted site in the years 1826-27, under the direction of M. T. T. von Littrow, the father of the present Director, and was adapted and equipped by him to meet as far as possible the requirements of a modern Observatory; but even at that period the surrounding buildings must have greatly militated against satisfactory astronomical work.

The present Director, M. C. von Littrow, repeatedly urged upon the Austrian Government the desirability of removing the National Observatory to a more favourable position, and ultimately, in 1873, obtained the sanction of the Minister of Public Instruction (K. von Stremayer) for the building of an Observatory adapted in every respect to the present state of astronomical science.

Before deciding on the plan and equipment of the new Observatory, the Austrian Government wisely adopted the suggestion of M. von Littrow, and sent Prof. E. Weiss, First Assistant of the Observatory, to visit the public and private Observatories of England and America, and the workshops of the instrument-makers in these and continental countries.

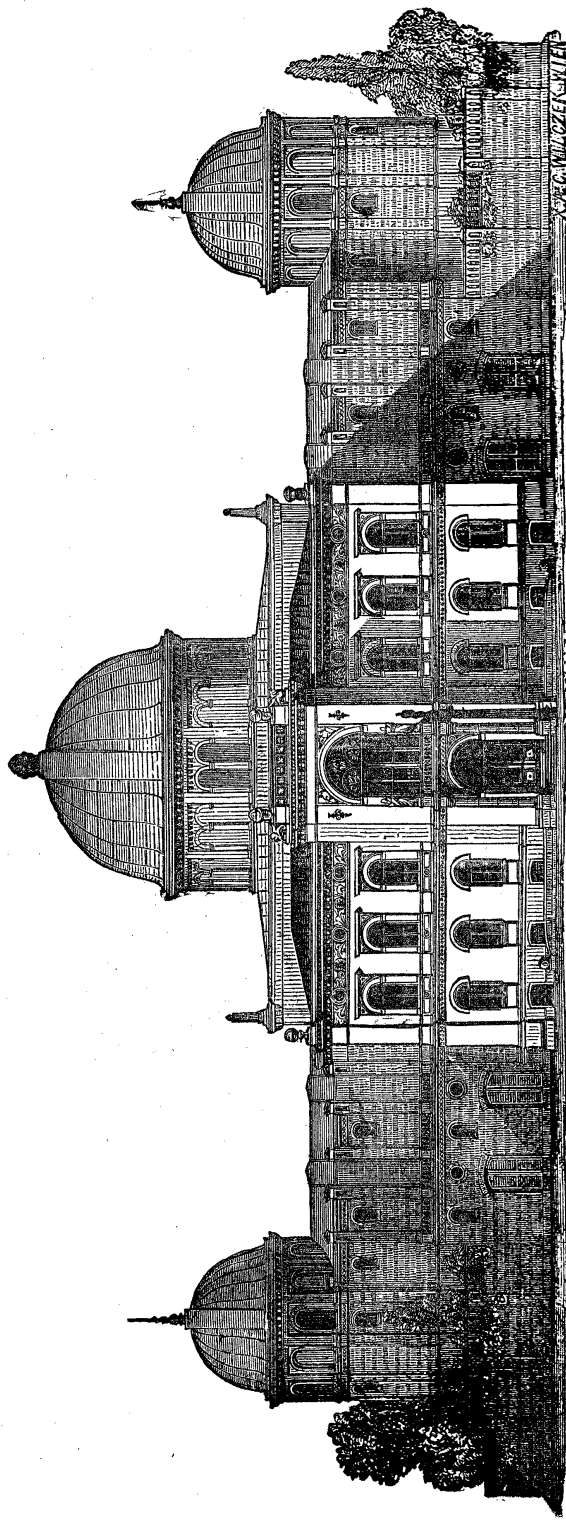
From information thus gathered it was determined to ask the Government for a refractor of about 26 inches aperture as the principal instrument of the new Observatory; this necessitated a dome of 42 feet internal diameter, and formed the starting-point in the consideration of the general plan of the Observatory, which has been ably worked out by the architect, M. F. Fillner, under M. von Littrow's direction.

The site of the new Observatory is admirably chosen three miles to the north of the centre of the city: it consists of a plateau of between 14 and 15 acres, at an elevation of about 200 feet above the mean level of Vienna. The new Observatory is 330 feet long in the direction of north-south, and 240 feet in that of east-west. The foundation stone was laid in June 1874, and it is hoped that the building will be completed in 1877. Judging from the great progress which had been made when

I visited it in October, I believe that it will be ready to receive the instruments at that time. The buildings comprise the dwelling of the Director and apartments for the assistant astronomers. Although the personal comfort of the astronomers will be greatly promoted by residence within the walls of the Observatory, it would have been, in my opinion, preferable for the dwellings to have been detached, as the heated air emanating from them will be liable to disturb the definition of the instruments.

Fig. 1 represents the south front of the Observatory, the central entrance opening into the dwelling of the Director, which is to the south of the large dome—not, perhaps, the best position that could have been selected.

FIG. 1.



The large Equatoreal which is to occupy the central dome has been ordered of Mr. Howard Grubb, of Dublin, who has also been intrusted with the construction of the revolving dome intended to cover it, as well as that of the three smaller domes, two of which are situated east and west of the central dome, and are shown in figure 1. One of these domes will contain an equatoreal refractor of 12 inches aperture, ordered of Mr. Alvan Clark, of Cambridgeport, Mass., which will be finished about the end of 1876. These two instruments, together with a meridian circle having a telescope of 8 inches aperture, and augmented by the instruments already in the old Observatory, will constitute the first equipment of the new establishment. Later on it is intended to place in the third dome an equatoreal reflector specially adapted for photography, and also a prime vertical instrument in the room near the fourth dome, to the north of the central dome.

FIG. 2.

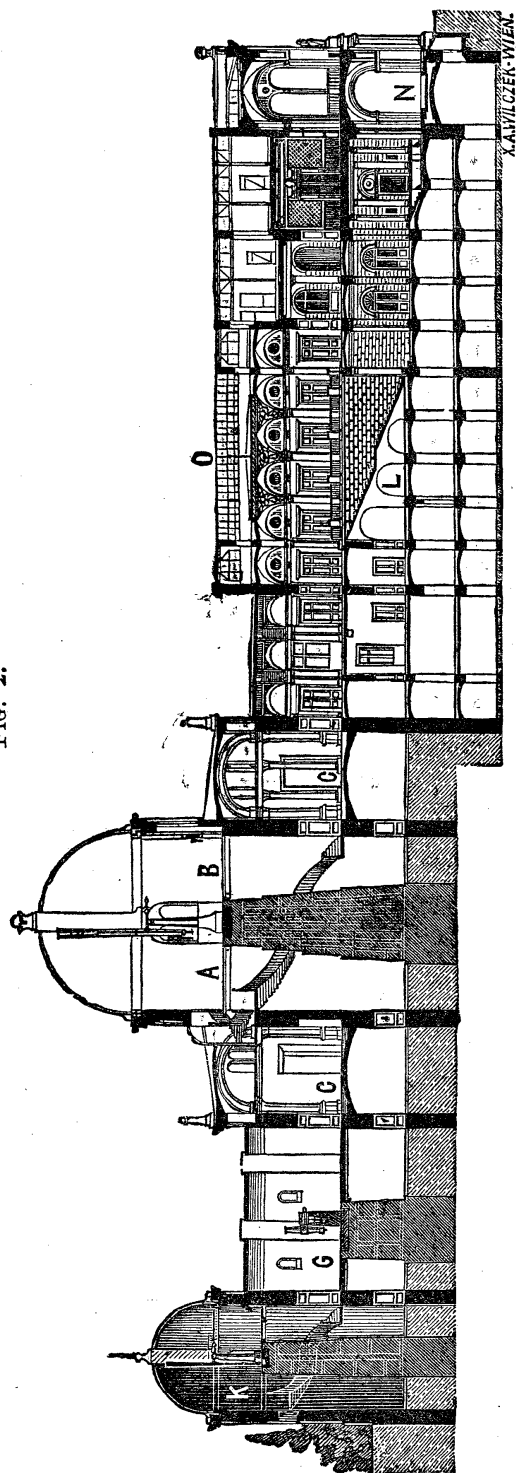


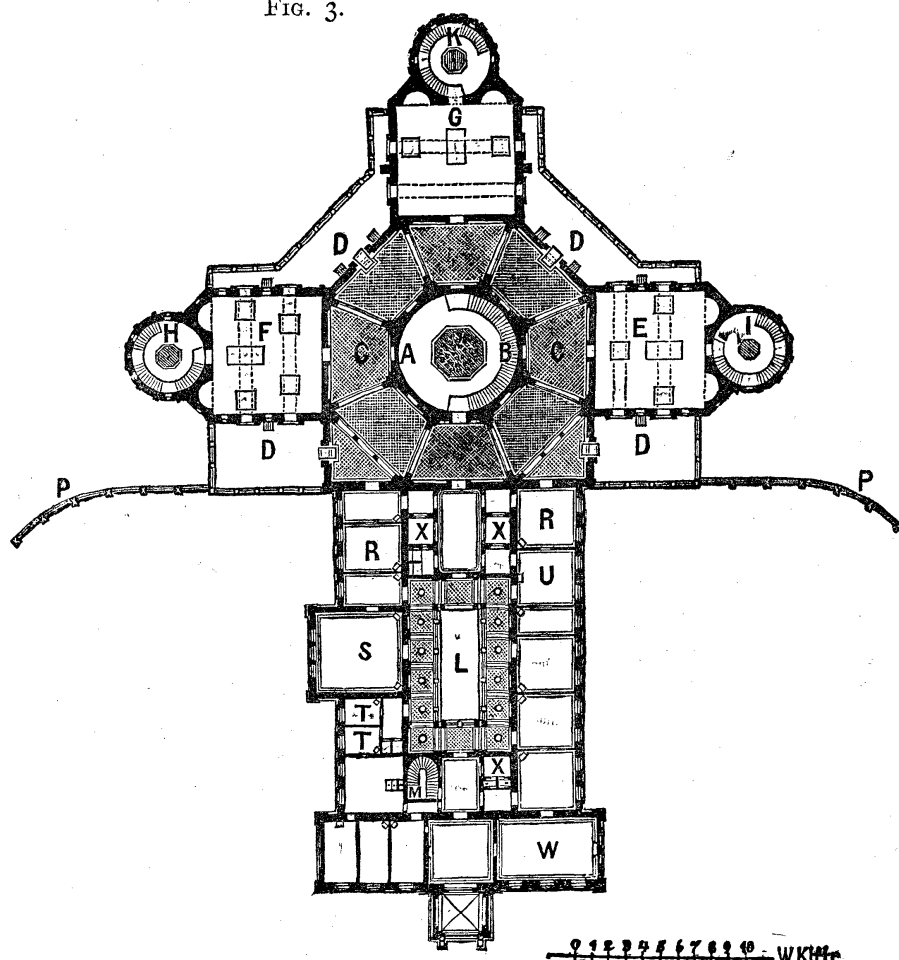
Figure 2, drawn on a smaller scale than Fig. 1, shows the general arrangement of the establishment in plan. A B is the great dome, 42 feet in diameter; this dome is surrounded at its lower portion by the central hall C C, which



will contain all the portable instruments. From this central hall access is obtained to the terraces D, adapted for observations with portable instruments or the naked eye. The rooms E and F will receive the meridian instruments, and in G is to be placed the prime vertical. The smaller domes, H, I, and K are each 25 feet in diameter: besides the instruments before spoken of, one of these domes will most probably be equipped with an altazimuth or a heliometer. The 12-inch Alvan Clark is to be used mainly and continuously for the determination of the position of the small planets and comets.

The connection of the dwelling-house with the Observatory is best shown in the section Fig. 3, which is on the same scale as Fig. 1. It will be seen that the first floor of the Director's house is on the same level as the ground floor of the Observatory; the apartments of the assistant Astronomers are on the ground floor. CC show the section of the gallery surrounding the ground floor of the great dome; L the section of the staircase. Referring again to Fig 2, W is the Director's house in plan; S and T T the library; U the lecture theatre; and lastly, R the offices.

FIG. 3.



From the preceding description it will be seen that Austria

to Lord Lindsay and Mr. Gill, *On Reductions of their* xxxvi. i,

will not be left behind in the steps which are being taken to promote Physico-Astronomical observations; and I sincerely hope that our own Government will ere long adopt measures to ensure to England a fair chance of honourably competing in the advancement of that branch of Astronomical Science which the Fellows of this Society have done so much to promote mainly from their own individual resources.

---

*On the State of the Reductions of their Observations of the Transit of Venus.* By Lord Lindsay and Mr. Gill.

The observations accumulated during the Expedition are:

(1) Those connected with the geographical position of the station, Belmont, and the connection of that with neighbouring stations.

(2) Observations connected with the determination of the Solar Parallax by *Juno* and *Venus*, including the observations for ascertaining instrumental constants and corrections.

(3) Observations of a few objects of interest in the Southern Hemisphere, such as double stars; however, for this class we had but little leisure.

(4) The measurement of a base, and exact triangulation of the Great Pyramid of Gizeh.

As yet the reduction of this mass of observations has been confined chiefly to those that come under section (1). This section includes—First. Determinations of differences of longitude by interchange of telegraphic signals, and secondly, by transport of chronometers.

The determinations by telegraph are, between—

1. Belmont and Pamplémousse (Mr. Meldrum's Observatory).
2. Belmont and Solitude (the German Station).
3. Aden and Bombay (Chambers' Observatory).
4. Aden and Suez.
5. Suez and Alexandria.
6. Alexandria and Malta.
7. Malta and Berlin; and
8. Alexandria and Berlin direct.

We cannot sufficiently express our thanks to the various Telegraphic Companies for their excessive kindness and the liberal manner in which the lines were placed at our disposition over so great a length, or to the *employés* on those lines, who rendered all and most willing assistance and information.

The chronometrical determinations are, between—

- |                                   |          |                |
|-----------------------------------|----------|----------------|
| 1. Belmont and Pamplémousse Obs.  | 8 chron. | } Double runs. |
| 2. Belmont and Solitude . . . . . | 36 „     |                |